A Study of the Acceptance of Technology Products among the Elderly People in Urban Taiwan

Yen-Jen Chen
Associate Professor, Department of Social and Policy Sciences, Yuan Ze University, Taoyuan, Taiwan
The Coming of the Aging Society

- In aiding prevalent longevity, technology encounters personal as well as age-related problems such as physical and psychological deterioration and income reduction.
- A new market of wise-living technology is shaping for the elderly.
- It is to develop a user-centered technological system to better the quality of life in an aging society.
Double Effect of Aging and Fewer Children

Increase in average life  ⇀  Inverted pyramid structure of population

Aging and fewer children make:

◎ the significance of manpower in caring
◎ double benefit if technology is brought into the Industry of caring
### Aging Society – OECD Experiences

Increase in life expectancy leading to increase in dependency ratio

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>OECD Average</strong></td>
<td>61.6</td>
<td>51.6</td>
<td>49.6</td>
<td>48.9</td>
<td>53.8</td>
<td>60.7</td>
</tr>
<tr>
<td><strong>Japan</strong></td>
<td>56.1</td>
<td>43.7</td>
<td>46.4</td>
<td>56.0</td>
<td>65.6</td>
<td>67.4</td>
</tr>
<tr>
<td><strong>Korea</strong></td>
<td>82.7</td>
<td>44.6</td>
<td>38.9</td>
<td>40.3</td>
<td>41.6</td>
<td>52.5</td>
</tr>
<tr>
<td><strong>Taiwan</strong></td>
<td><strong>92.0</strong></td>
<td><strong>49.9</strong></td>
<td><strong>42.3</strong></td>
<td><strong>36.6</strong></td>
<td><strong>40.7</strong></td>
<td><strong>53.5</strong></td>
</tr>
</tbody>
</table>

Note: Dependency ratio refers to the percentage of 0-14 and above 65 years old in population.

Tawan YZU, Yen-Jen Chen
 Structural Change in Taiwan’s Population

台灣人口結構的變化

陳燕禎整理製作（資料來源：內政部統計處人口年齡分配，2008）
Rapid Decline in Birth Rate of Taiwan
6.6 Million Caretakers Need to Take a Break

背負篇

朱武智／台北報導

每天工作十四个小时，無薪資、無勞保、無休假，任勞任怨，最終經過十年工作，根據相關機構估計，六萬名家庭照顧者們的身心都快喘不過氣來。

調查發現，若無親人的幫助和照顧或社區資源的協助，家庭照顧者們的生活和家庭都將受到影響，而社會資源的不足，讓照顧者的身心都能喘不過氣。

獨力顧廬母

她快撐不下去

無怨無悔

現年50歲的薛麗卿，一生辛苦，早已受盡母親的挫折和奔走。無怨無悔，她就是這樣度過。因為無怨無悔，她才會有幫助母親活下去的力量。她說，照顧母親，她不怨怨，也不勸勸。

元智大學 社政系 陳燕禎 博士
72歲子陪98歲母
40年天倫相伴

稿詩朗韓娛親
（記者湯政玲／雲林報導）72歲的王詩朗，無怨無悔照顧高齡98歲的母亲。他說，「老來子」的他們，是現代老人的代表。在攝影記者的鏡頭下，王詩朗的身影，漫步在公園的石徑上，緩緩的腳步，彷彿在訴說著一段不為人知的故事。

「母親的手，充滿了對子女無限的愛與溫柔，母親的手，濃縮了一生的辛勞渾染，母親的手，是春風，是暖陽，是推動世界的力與。」王詩朗說，母親對他來說，不僅是生命中的導師，更是無言的支柱。

以前，王詩朗在工作上遇到了許多艱難的時刻，母親總是堅定地站在他身後，給予無言的支持。如今，母親卻陷入了病痛的折磨，王詩朗的心，也被深深的痛楚所圍繞。

為了盡一份孝心，王詩朗決定棄商從醫，進行了多年的醫學修習，並在母親的病痛中，不斷地尋找著治療的道路。

「母親在病痛中，我們要像母親一樣，勇於承擔，勇於面對。」王詩朗以他父親名義，捐出一筆護理基金，用以幫助更多患有老年疾病的老人。

在這個充滿了變化和挑戰的時代，王詩朗用他的行動，證明了愛與溫暖的力量，讓我們懂得了，愛不言棄，溫柔永存。
Who is Taking The Responsibility

誰來照顧？誰在照顧？
不便护理压力 孝媳枕头闷死婆婆

李葆仁

元智大学 社政系 陈燕祯 博士
Social Care: Developing Service Provision of the Market Sector

Government sector

Volunteer sector

Users

Market sector

Community sector

Quasi- government (non-profit)
Quasi-government (volunteer)
Independent volunteer organisation

Government service

Friends
Neighbours
Family

Private industry
Transformation in Elderly Care: Aging in Place

De-hospitalization  De-institutionalization  Communalization  Familization
“Caring Industry Policy” in Contemporary Taiwan

- Range of the care service industry

圖1：照顧服務產業範疇
資料來源：照顧服務產業推動執行手冊(經建會等，2003)
Long-term Carers’ Pressure and Needs for Service

- Carers’ physical and mental health
- Neglection of feelings and experiences
- Economic dependency and poverty
- Carers’ needs for welfare

Long-term carers’ pressure
Development of the Elderly Care Industry

- Industrialization of care service: nationalization, industrialization, familization and technologization of care service since 2002.
Problems of the era of ‘Two Waves’

1. The elderly welfare technology becomes an important issue in the development of the aging society.

2. The elderly welfare technology must be improved by focusing on the elders’ negative experiences with and resistance against the products so as to augment their acceptance and usage.

3. It is to make every elder enjoy the convenience brought by the technological life.

4. It is an imperative tool for ‘healthy aging’, a dignified life in old age.
閃耀中的銀髮市場

◎亞洲十一國銀髮消費新勢力

◎銀髮族的人生經歷、發展經驗與未來願景

◎亞洲人口結構巨變帶來巨大商機

◎2015年亞洲銀髮商機大未來

聰明機器人 事事提醒防健.wmv

日本寵物高齡化 看護商機夯.wmv

日本機器人進入廚房.avi
熟年商機不容小覷

◎戰後嬰兒潮出生的熟年世代，歷經台灣經濟起飛，手中擁有全台灣55%以上的財富，他們是全台最有消費力的一群人。
◎當這群人進入熟年階段，家庭負擔變輕，他們愈來愈肯為自己花錢，勢將成為消費市場主流，引爆的熟年商機不容小覷。

高臨社會來臨 銀髮族新產業正火熱.mpg
「熟年工藝」為銀髮族設計工具.wmv
「以房養老」規劃方案 65歲以上可貸5成.flv
[CM] 飛飛 - 銀寶善存.flv
Bilateral Interaction: Elderly Welfare and Techno Care

Survey on the elderly’s needs

Analysis of the elderly’s needs

Interaction between needs and services

Design and delivery of service
How Techno Products Suit the Needs of the Elderly in Daily Life

• Techno products are mostly for the youth and the professional, and very few for the elderly.
• To develop techno products and provide user-friendly environment for the elderly is an issue that requires serious attention in the aging society.
• The elderly industry is a new market full of potentials.
• A shining market: The elderly are becoming a new force of consumption in 11 Asian countries.
• Blooming business: The elderly are more willing to invest on themselves, hence are becoming a major force of consumption in the market.
• A platform for happy and independent living: ‘Energy, Comfort and Adequate’ have become a new mode of living for the elderly
• The elderly industry in Japan is blooming. The elderly have been widely targeted in terms of eating, clothing, living, transportation and entertainment.
Of the whole population of 22.7 million in Taiwan, those who are above 65 years of age comprise 10.4%. Where is the business:

- Elderly recreation, nursing houses and elderly techno housing, elderly apartment, community care, long-term care.

- Techno auxiliary appliance/toys, long-distance house care, elderly mobile phones, techno wheelchair.
– House delivery for the elderly, internet, continuing education, marriage industry for the elderly, counseling, funeral arrangement.
– Anti-aging products, elderly magazines, elderly tourism, elderly human power, elderly clinics.
– Health food, anti-aging meals, anti-aging drinks, and elderly care in medicine, nutrition and many others.
Factors for the Elderly to Accept Techno Products

- Primary factors in the elderly’s acceptance of techno products: safety, convenience, and humane social support system.
- Moxley’s 5As service delivery principle:
  - 1. availability
  - 2. adequacy
  - 3. appropriate
  - 4. acceptability
  - 5. accessibility
-  +3:
  - ♦ accountability
  - ♦ affordability
  - ♦ Quality (Chen, 2009)
5A Technological Service Network

Service Delivery

Acceptability

Accessibility

Availability

Adequacy

Appropriate

5A’s Principle

資料來源：（陳燕禎製作，2007：老人福利理論與實務：本土觀點。台北：雙葉書廊）
Aim

• Baby boomers after WWII in Taiwan have come into their old age. Developing the welfare technology for the elderly people is therefore a very important issue.

• The study aims to discuss the elders’ acceptance of technology, and their experiences, barriers and expectations of operating interface and function improvement.
Method

• Quantitative method is adopted and focuses on those who are over the age of 50 and attend senior colleges in urban area. 403 questionnaires are gathered.
Aim

1. To explore the elderly’s acceptance of techno products and the difficulties in operation.

2. To analyze the usage problems of the elderly-perceived usability, perceived ease of use, and expectation for the improvement of function.

3. To provide suggestions for the development of elderly welfare technology.
• Studies suggest that baby boomers have more experiences in using technology and computer.

• Use of techno products becomes a new trend in the market of the elderly in view of the post-war baby boomers’ higher education, better economy, and more experiences with technology.
3. Galvin and Scherer in 1989 propose to:

- Matching Person and Technology (MPT)
- Evaluation of auxiliary technology and its results must include three factors: environment, people and technology.
• Tahkokallio considers elderly welfare industry is an interdisciplinary development that emphasizes the idea of ‘inclusive design’.

• In terms of auxiliary design, the real users are those who are closest to the elderly, such as the medical carers, caring children, and caretakers.
• History of making daily life electronic appliance: the case of Tatung Rice Cooker:  
• Tatung Rice Cooker was made in 1959. It challenged the habit of cooking at that time.  
• Tatung Rice Cooker reduced the general fear by ease-to-use operation and adequate maintenance system.  
• It has become a general household appliance and a must for the students studying overseas.
• Most techno products exclude the needs of the elderly on account of operation.

• For example, because of physical deterioration, e.g. eyesight and hand mobility, and of the fact that the mobile phones are getting slimmer and smaller, the elderly are unable to see, let alone use, the mobile phones.

• The inconvenience with using techno products defeats the elderly.
• Huang (2008) points out that the males of 60-70 years old use the mobile phone mostly to contact family or friends. Besides, 30 interviewees from 50s to above 80 indicate the reasons for not using mobile phones as (1) no need; (2) high rate; (3) self-limiation; (4) illiteracy.

• The elderly who have higher social participation and are female are more likely to use mobile phones.
• Chen and Wu (2004) study the places where the elderly use life techno products most, and focus most on bedroom, kitchen and where family chores are carried out. If they are live with children, there are more computer-controlled products at home, and they are more willing to use them under the children’s instruction.

• Chien (2008) finds through survey that the application of wise technology to home safety and health is generally considered as necessary.
• Kuo (2001) finds that there are more males than females in using mobile phones, but the experience of which is mostly confined in ‘dialing’ rather than the in-built function of ‘directory’.

• Chao (2004) finds from 90 interviewees that there is a steady decrease in time spent on mobile phone with the increase in age. For those above 65 years of age, there are 17 who use mobile phone every day.
• The interface and functions of the techno products are alien to the elderly due to their lack of experience with them.
• The elderly are even more afraid that the products break because of their improper usage.
• Hence the elderly caution and even resist against using techno products out of fear.
• Usability is a common criterion for evaluation after product development.
• In the Guidance ‘usability’ is defined as the ‘effectiveness, efficiency and satisfaction of certain users under certain circumstances’.
• Yue et. al. (2010) propose to design the products for the elderly along 4 criteria – elderly-friendly interface, simple functions, stable system and instinctive usage – based on their study of usability of ‘Wise Pill Box and Reminder System’.

• Evaluation of acceptance is to make the researchers to understand the users’ problems with and evaluation on the products.
• On the acceptance of techno products, Fishbein and Ajzen (1975) propose the theory of reasoned action and suggest that intention, attitude, subjective norms and motivation may affect behaviors.

• Davis (1986) uses ‘Technology Acceptance Model’ (TAM) to explain, diagnose and predict the users’ attitudes and behaviors in face of new information system.
• Davis maintains that the external factors, i.e. the system’s characteristics, design, operation, interface, and the training, documentation and consultation, all affect the users’ cognition and value. Hence it is important that the techno products are equipped with ‘perceived usability’ and ‘perceived ease of use’, namely, easy-to-use interface design.
• Research Framework

• framework.docx
Research Analysis

• 1. Analysis on the demography of the respondents. (see table 1) (Table1.docx)

• 2. Analysis on the previous experiences of using tech products. (see table 2) (Table 2.docx)

• 3. Ranking of the reasons for using/refusing tech products. (multiple choice, see table 3) (Table3.docx)
Chi-square test of the frequently used techno products by the middle aged and above users:

1. Chi-square test on ‘perceived usability’
   (see table 4) (Table4.docx)

2. Chi-square test on ‘perceived ease of use’
   (see table 5) (Table5.docx)
Results

- The result shows whether the elderly people use technology products has highly significant relation with gender, education, occupation, health condition, monthly expenditure, residence and whether he or she attends senior colleges.
A. Conclusion:

(a) Reasons for the middle aged and above users to use techno products:

1. The most frequently used techno products by the middle aged and above users are products of 3C and entertainment, the reason being for the ‘family necessity’. The reasons for NOT using techno products are mainly for ‘little necessity’, ‘high cost’ and ‘usage problems’.

2. There are apparent differences along the interviewees’ background, economic status, living condition, and experience with techno products.
• (b) Product price is also an important factor.
• (c) According to the chi-square test, there is significant relation between monthly income and the use of products.

• Hence the price of product should be made in accordance with the users’ capabilities.
Expectations of the Middle Aged and Above Users for the Improvement of Operation.

A. Problems of using techno products:

- 1. Procedure is too complicated.
- 2. Fonts are too small.
- 3. Messages are hard to understand.
- 4. The manual is Greek to me.
- 5. Bottoms are too small for my fingers.
B. The 6 most expected functions of the interface are:

- 1. Bottoms on the interface are easy to use.
- 2. Remote control is easy to use.
- 3. Mouse is easy to use.
- 4. Imputation by screen touch is easy to use.
- 5. Imputation by keyboard is easy to use.
- 6. Stick control is easy to use.
C. Findings suggest that 96.5% of the users who have negative experiences are willing to try the products again should the problems be improved.

D. Chi-square test suggests that there is significant correlation between operation improvement and users’ willingness to use products. The ratio is even higher amongst those who share average experience with technology.

Thus it is known that the improvement on operation would increase the willingness to accept the products.
♦ According to the chi-square results:

- (a) There is significant difference along education, vocational status, and monthly expenditure in relation to the use of techno products. If improved, the functions such as imagesetDescription besides function bottoms, screen display of messages and image messages can simplify the operation and narrow the gap between different usage needs.

- (b) Thus the design for the elderly welfare products should fulfill the elderly’s physical and mental needs as well as their economic affordability.
B. Suggestions (1)

1. The products should consider the age problem and fulfill the needs out of physical and mental deterioration.
2. The problems with fonts, function and operation should be countered.
3. There should be ‘one touch’ and ‘one minute setup’ functions in the products.
4. Price should consider the general affordability of the elderly.
5. Service should consider accessibility for the elderly and include children into the support system.
6. The products should aim for ‘life integration’ to increase their acceptance among the elderly.
Suggestions(2)

- Principles for the Development of the Elderly Welfare Products.
- Besides the 5As service delivery principles, attention should be paid to the following needs:
  - 1. Usability of the products.
  - 2. Easy-to-use of the products.
  - 3. Good-to-use of the products.
  - 4. Durability of the products.

- Market price should consider the affordability of the general public:
  - 1. Acceptability of price: A cheap and convenient market.
Finally, the study also suggests that the technology products developed for elderly people must consider the need of those whose physical function degenerate, and improve the complicated operating interface and user barriers caused by it, and be designed in “one finger operating mode” and “one minute set up mode”.

B. Suggestions (3)
C. Research Limitation and Suggestions for the Future Study

• I. Research limitation
  • (a) The research is a preliminary study targeted on the middle aged and above people.
  • (b) The dependent variables are inductive and are more out of assumption; hence caution is required in citing.

• II. Suggestions for the future study
  • (a) The research finds a highly significant relation between the elderly’s acceptance of technology and the support system provided by computer courses. Future study can probe into the support system of the techno service.
  • (b) Qualitative research should be conducted to collect deeper and more fundamental information.
熟年八大商機 台灣總計超過一兆元

• 商機1 醫療保健 保健食品市場逼近三百億元
• 商機2 金融理財 保險總值將達一千億元
• 商機3 養生住宅 美國市場將超過三百億元
• 商機4 學習才藝 學習音樂成年人口攀升
• 商機5 休閒旅遊 日本熟齡旅遊人數成長兩倍
• 商機6 科技智慧 上網購物潛在商機驚人
• 商機7 生活消費 創業者最易進入之行業
• 商機8 懷舊商品 音樂公司搶攻懷舊市場
樂齡生活事業平台：「活力・安適・精緻」

- 樂齡生活事業股份有限公司(L’elan Enterprise Co., Ltd.)，是全國第一家以滿足銀髮族食、衣、住、行、育、樂等全方面需求為目標而成立的企業。
- 以「成為樂齡族群建構健康〈身〉、喜樂〈心〉、平安〈靈〉生活的補給站。」為公司事業願景。
- 預計在十年內「成為華人區首屈一指的銀髮生活事業平台」。
日本的銀髮產業蓬勃發展，舉凡食衣住行育樂，皆有專以銀髮族為目標的產品。

從美國跨海到日本，結合了此一商機，為中高齡女性打造適合她們的健身課程。

1. Bmp
2. bmp

提供優美的音樂、浪漫的燈光，同時還有健康的飲食，鎖定家庭市場。

elder cafe

Elderly Industry and Business--Japan

銀髮產業與商機-日本

從美國跨海到日本，相中了此一商機，為中高齡女性打造適合她們的健身課程。

Curves

• 結合醫療的健身俱樂部

Jym

• 人要裝4654654 (2).wmv

元智大學社政系 陳燕穎 博士
Thank You!